Appl. No. 10/789,210
Response Dated 23 May 2007
Reply to Office Action of 23 January 2007

Attorney Docket No. 26.0273 US

Page 13 of 16

REMARKS

Claims 4, 5, 7-18, 20-23, 25-54, and 58-79 are pending in this application. Claims 20-23, 25-54, 62-73, and 75 are withdrawn from further consideration pursuant to a restriction requirement. By the present amendment, independent claims 74-76 have been amended and new claims 77-79 have been added (shown in the Listing of Claims attached hereto) in order to more particularly and completely claim the present invention. For purposes of consistency with amended independent claims 74-76, dependent claim 24 has been cancelled, and other dependent claims have been amended. No new matter has been introduced. Reconsideration and allowance of the pending claims is hereby requested.

Substance of Telephone Interview on April 24, 2007

Applicants provide a statement of the substance of the telephone interview with the Examiner on 24 April 2007 as follows:

Applicants' undersigned attorney thanks the Examiner for the courtesies extended during the telephonic interview on 24 April 2007. No exhibits were shown or any demonstrations conducted. Independent claim 74 was discussed with respect to the 35 U.S.C. §112 rejection of the claims. No prior art was discussed. The Examiner and applicants' undersigned attorney discussed possible amendments to claim 74, but no agreement was reached.

The principal arguments presented to the Examiner and proposed amendments are presented below in the section titled "Claim Rejections – 35 U.S.C. §112."

Drawings

In view of the foregoing amendments to the claims, applicants request withdrawal of the objections to the drawings. Applicants believe that the drawings previously submitted show every feature of the invention specified in the amended claims herein.

Claim Rejections – 35 U.S.C. §112

As proposed during the telephone interview, claim 74 has been amended to clarify the step of "displaying a projection log of dispersion curve data for each depth versus depth." Support may be found in Figures 4D and 4F, and at page 3, paragraph 34, of the publication of the

present application. In view of the claim amendments herein, applicants believe the claims comply with the requirements of 35 U.S.C. §112, first and second paragraphs. Therefore, this rejection of the claims should be withdrawn.

Claim Rejections – 35 U.S.C. §102 and §103

The Examiner has rejected claims 7-11, 74, and 76 under 35 U.S.C. 102(b) as being anticipated by Kimball (US 5,278,805), and claims 4, 5, 12-18 and 58-61 under 35 U.S.C. 103(a) as being unpatentable over Kimball in view of other cited references. Reconsideration is requested.

Independent method claim 74 specifies:

"processing the acquired sonic data to generate a slowness-versus-frequency dispersion curve for each depth;
    displaying a projection log of dispersion curve data for each depth versus depth."

Similar claim language is present in independent claim 76.

The prior art of record does not disclose or suggest processing acquired data to generate dispersion curves for each depth and displaying a projection log of dispersion curve data for each depth versus depth.

Kimball does not process <u>acquired sonic data</u> to generate a slowness-versus-frequency dispersion curve for each depth. Kimball discloses "selecting a model curve" (note Office Action at page 2), which is not the same as processing <u>acquired</u> data to generate dispersion curves for each depth since acquired sonic data are not processed to generate <u>model</u> dispersion curves. Kimball does not teach or suggest that acquired sonic data are processed to generate model dispersion curves, which are then selected as proposed by the Examiner. In contrast, claims 74 and 76 specify that acquired sonic data are processed to generate dispersion curves for each depth.

Appl. No. 10/789,210
Response Dated 23 May 2007
Reply to Office Action of 23 January 2007

Attorney Docket No. 26.0273 US

Page 15 of 16

In contrast with the present invention as claimed in claims 74 and 76, Kimball uses model dispersion curves to backpropagate Fourier transformed data signals so that "a [model] dispersion curve which most closely matches the actual dispersion curve of the formation is found." See Kimball at column 9, lines 56-65. As depicted in Figure 3A of Kimball, after stacking and STC processing, peaks are found and the formation shear slowness is identified. A log of shear slowness over borehole depth is generated, as depicted in Figure 6 of Kimball.

As is clear from the description in Kimball, the processing of Kimball does not generate a slowness-versus-frequency dispersion curve for each depth from acquired sonic data. Kimball's processing uses previously stored model dispersion curves. Kimball also fails to disclose or suggest "displaying a projection log of dispersion curve data for each depth versus depth," as specified in instant claims 74 and 76. New claims 77-79 have been added to specify that slowness-frequency data are projected onto the slowness axis. Support for claims 77-79 may be found at page 3, paragraph 33, of the publication of the present application.

The Examiner has indicated that Kimball discloses use of the mathematical technique known as "projection." See Office Action at page 10. Projection of data, as claimed herein, is implemented by known mathematical techniques. See page 3, paragraph 33, of the publication of the present application. Merriam-Webster Online defines projection as "the process or technique of reproducing a spatial object upon a plane or curved surface or a line by projecting its points." Kimball does not disclose or suggest the use of such a technique for displaying dispersion curve data, as specified in the instant claims.

Independent claims 74 and 76 specify displaying a projection log of dispersion curve data for each depth versus depth. New dependent claims 77 and 79 specify projecting slowness-frequency data onto the slowness axis. As discussed above, in Figure 6 of Kimball, the final results of Kimball's processing in Figures 3A and 3B, i.e., the formation shear slowness, over borehole depth are displayed. Figure 6 of Kimball does not disclose or suggest displaying a log of the projections of dispersion curve data for each depth versus depth. See Kimball at column 15, lines 3-6.
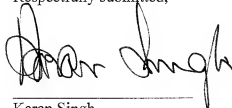
As shown in, for example, Figures 4A-4F, 5A-5C, and 6A-6D (and further described in the accompanying text), the present invention contemplates generating slowness-versus-frequency dispersion curves from acquired sonic data and displaying a projection log of dispersion curve data for each depth versus depth. As a consequence, significant improvements and advantages over conventional methods of displaying sonic logging data are obtained.

For the reasons discussed above, the prior art of record does not disclose or suggest the features claimed in independent claims 74 and 76. Therefore, independent claims 74 and 76 should be allowable and the claims depending from independent claims 74 and 76 also should be allowable for at least the same reasons as stated above.

In light of the above remarks, applicants believe that the present application and claims 4, 5, 7-18, 20-23, 25-36, 58-61, and 74-79 are in proper condition for allowance. Such allowance is earnestly requested.

In the event that any additional fees or credits are due owing to this response, the Commissioner is hereby authorized to charge the amount necessary to cover any fee that may be due or to credit any overpayment to Deposit Account 50-1122.

Respectfully submitted,

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